

## Projecting Lincolnshire's Electorate – Methodology Paper

The methodology detailed below was put together in line with many of the recommendations made in the Electoral Commissions guidance paper entitled 'Electorate Forecasts – A Guide for Practitioners (October 2011)'. This paper can be viewed or downloaded at <https://www.lgbce.org.uk/policy-and-publications/guidance>

### 18 Plus Population and Households

The starting point for this work, like most population exercises, was that of the Census, and more specifically information from the 2001 and 2011 Censuses.

This invaluable source provides us with the most accurate figures, both for households and the 18 plus population in Lincolnshire.

Using this information we were able to calculate what the average 18 plus population to household ratio was at ward level for both 2001 and 2011.

Interestingly this showed that at the county level this ratio only fell from 1.88 to 1.87 (a change of -0.01) over that ten year period, this is despite a much longer term trend for falling average household sizes. There is a national debate, related to planning for housing, on whether this is partly an effect of the recession and the longer term trend will resume.

However, at ward level this change in household size ranged from an increase of 0.84 in Carholme ward to -0.25 in Ingoldmells ward. This change in the 18 plus population to household ratio between 2001 and 2011 was then projected forward for each ward to give us ratios for 2014, 2015 and 2021.

### House-building

Next and using the 2011 household figure as a baseline, we used information provided by the districts on actual and projected house-building during the period between 2011 and 2014 to arrive at a baseline figure for households in 2014.

This information on current and future sites is provided with easting and northing co-ordinates so can be accurately plotted to ward and electoral divisions. It provided us with information on all large sites in the county that are under construction, have planning permission and are to be constructed by 2021, and remaining allocation without planning permission.

In the main we have only used housing that was either under construction, or had planning permission and was due to be constructed by 2021, as part of the electorate forecasting process. This was because the guidance states that "*the inclusion of a site which does not even have planning permission will require particular justification*". The exception to this is three sites included which are

allocated but are yet to be granted planning permission. These sites have been included on the basis of information from colleagues in the districts concerned. Please note this house building information did not include small sites (i.e. those of up to 10 dwellings). However, the guidance does state that *"it is generally not necessary to (include) small sites..."*

## **Electorate Ratio**

The guidance points out that *"the registered electorate does not necessarily equate to the population of voting age: it is not only children and young people under 18 who can't vote, but also those who are ineligible or who choose not to register or fail inadvertently to register. For example, one authority estimated that in 2010, registration rates ranged from 75% in one ward to 99% in another."*

Furthermore the Electoral Commission *"caution against calculating an adult population to electorate ratio from data for a single year. To do so would introduce a risk that the ratio calculated may not be representative."*

With this in mind we used the historical electorate figures for electoral divisions for various years provided by the Electoral Commission stretching back to 2001.

However this posed an initial challenge as electoral division boundaries are not coterminous with those of wards. This is further complicated by the fact that there have been several changes to ward boundaries during the period 2001 to 2014.

To determine what these historical electorate figures were at ward level we devised a method using a piece of GIS (Geographical Information System) software called Code Point (produced by Ordnance Survey) which enabled us to apportion housing between the different wards that make up each division. These splits were then applied to the electorate to provide us with ward level electorates for the years 2001, 2009, and 2013.

*"A ratio to be applied to forecast populations may be found from the average ratio observed at authority level in recent years or by extrapolating by eye or by regression analysis, those observed data. We accept that neither approach offers a guaranteed representation of actual ratios in the future".*

In order to provide what we felt was the most statistically robust way of looking at future change in the electorate we set about looking at change in the electorate ratio over time between 2001 and 2014.

Changes in electorate between 2001 and 2009, 2009 and 2013, and 2013 and 2014, were all calculated at ward level. For each period we then calculated an average change across the wards and then applied standard deviation to these changes to see if movement in the ratio (either positive or negative) had been statistically significant.

If change was statistically significant in only one or none of the three periods we were considering then the electorate ratios were averaged across the period 2001 to 2014 and used as the basis for electorate projections in 2015 and 2021.

However, if change was statistically significant in two or all of the three periods we were considering then a yearly change in the electoral ratio between 2001 and 2014 was calculated and then applied to the 2014 ratio to project forward to 2015 and 2021.

Please note that throughout this entire process, estimates of the 18 plus population produced for the years 2014, 2015 and 2021, have been aligned at local authority district level with Office for National Statistics (ONS) Sub-national Population Projections. Why is this necessary? *"Because the tendency has been for local authorities to over-estimate population and electorate growth, the Commission's guidance recommends the use of ONS projections."*

This process is also useful in that it takes into account factors affecting population such as fertility and mortality rates which would otherwise be excluded if we considered population growth based on housing development alone.

### **The Overall Calculation**

With all of the above factors in place, beginning with our mid 2014 household baseline we added on projected house-building for 2014 to arrive at an estimate for the number of households in mid-2015. Our 2015 18 plus population household yield ratio was then applied to this to give us an estimate of the 18 plus population for 2015. This figure for 18 plus population was then adjusted at ward level so that all wards in each district totalled the 18 plus population projected by ONS. Our projected 2015 electorate ratio for the ward was then applied to this 18 plus population to give us an estimate for the electorate. This process was then repeated for 2021 to provide us with an estimate for the 2021 electorate.

All of this work was carried out at ward level on the basis that this was the geographical level at which we would be required to provide information to the commission